

A Survey of the Distribution of Leadbeater's Possum, *Gymnobelideus leadbeateri* McCoy in the Central Highlands of Victoria.

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Introduction

Leadbeater's Possum, *Gymnobelideus leadbeateri*, is a rare and endangered arboreal marsupial inhabiting montane ash forests in the central highlands of Victoria, south-eastern Australia (Thornback and Jenkins 1982). The species was re-discovered in the central highlands of Victoria by Wilkinson (1961). Virtually all subsequent records of the species are from this region. Leadbeater's Possum is known from an area within 37° 20', 37° 55' S latitude and 145° 30', 146° 20' E longitude (Fig. 1, Fig. 2, Appendix).

This paper describes the preliminary results of a survey of the distribution of Leadbeater's Possum in montane ash forests within several catchments administered by the Board of Works as well as areas managed by the Dandenong, Alexandra and Central Gippsland regions of the Department of Conservation, Forests and Lands. The results of the initial phase of the survey undertaken during 1983/84 have been published in Smith *et al.* (1985) and Smith and Lindenmayer (1988).

Methods

A dusk and night-time census of arboreal marsupials was undertaken at 152 sites, each of 3 ha located within, or close to, montane ash forests located in the

central highlands of Victoria during 1983/84 and 1987-1989. The stag-watching technique (Seebeck *et al.* 1983) was used to determine the diversity and abundance of animals at 148 sites.

Observers were positioned under hollow-bearing trees approximately 30 min before dusk and remained there until 1 h after dusk. A modified stag-watching program was followed at 4 sites which supported no nest trees. Volunteers were stationed at marked points set at 25 m intervals on the survey site and were requested to scan the canopy for the presence of animals for a period of 30 min before and up to 1 h after dusk.

Forests containing Mountain Ash, *Eucalyptus regnans*, Alpine Ash, *E.delegatensis* or Shining Gum, *Enitens obliqua*. The survey was stratified to include a range of forest types, ages, aspects and slope positions (ridge, midslope and gully). The number of nest trees on a site ranged from 0-34 per 3 ha.

Results and Discussion

The survey of the distribution of Leadbeater's Possum was highly labour intensive. Over 500 volunteers assisted in the study and more than 1200 person-hours were invested in the stag-watching program. A further 200 h were spent in spotlighting surveys. More than 1100 trees were stag-watched, approximately 15% of these on more than one occasion.

Leadbeater's Possum was recorded at 57 (38%) of all sites surveyed. Eighty-five colonies of Leadbeater's Possum were detected yielding a total of 206 animals. Colony size ranged from 1-6 individuals (mean = 2.42) and was highly variable,

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changing by as many as two animals between successive evenings. Considerable caution is needed when interpreting the results of the survey. The study was biased to include many sites with habitat considered favourable for Leadbeater's Possum to increase the probability of detecting the species. Large areas of montane ash forest were found to be unsuitable for Leadbeater's Possum through the lack of either suitable nest trees or foraging habitat or both.

The survey established the most southerly record of Leadbeater's Possum — on the Bunyip Rd., 1.7 km south-east of the turnoff with A.P.M. track, as well as locating many new sites 5 or more kilometres from previously known localities, particularly within water catchments administered by the Board of Works. The presence of Leadbeater's Possum was confirmed at "The Hermitage" (on the Black Spur, Maroondah Hwy), which is one of the only records of the species on private land. An additional 11 records of Leadbeater's Possum were established by spotlighting. A map of the new distribution records of the species together with those records in the Victorian Mammal Database at the Arthur Rylah Institute for Environmental Research is shown in Fig.

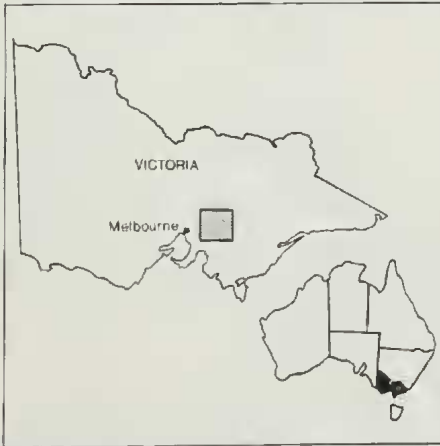


Fig. 1. The location of the study area in which surveys for Leadbeater's Possum were undertaken during 1983-84 and 1987-88.

2. The location of all new sightings is given in the Appendix.

Leadbeater's Possum was not detected at sites lacking nest trees or in areas of mixed species forest where *Eucalyptus obliqua* was the dominant species. The presence of Leadbeater's Possum was re-confirmed at, or close to, several localities last surveyed 10-15 years ago including Starlings Gap, Mt. Horsfall, Ben Cairn and Mt. Gregory. However, the vegetation at several other sites (e.g. Loch Valley, Penny's Saddle) had been extensively modified by timber harvesting practices, and Leadbeater's Possum was not detected.

Seven other species of arboreal marsupials and one species of scansorial marsupial were detected during the stag-watching program. These were Sugar Glider, *Petaurus breviceps*, Greater Glider, *Petauroides volans*, Mountain Brushtail Possum, *Trichosurus caninus*, Common Brushtail Possum, *Trichosurus vulpecula*, Yellow-bellied Glider, *Petaurus australis*, Common Ringtail Possum, *Pseudocheirus peregrinus*, Feathertail Glider, *Acrobates pygmaeus*, Eastern Pygmy-Possum, *Cercatetus nanus*, and the Brown Antechinus, *Antechinus stuartii*.

Mimicking the alarm call of Leadbeater's Possum was successful in attracting the species. Tape recordings of the call were made from animals removed from nest boxes at the Yellingbo State Nature Reserve. This call was subsequently mimicked during field surveys of the species. Leadbeater's Possum responded to the call on numerous occasions, approaching close enough to be captured by hand. This technique may have some merit as a survey tool, particularly as other techniques of detecting Leadbeater's Possum are either very labour intensive (stag-watching) or have a low rate of success (trapping and spotlighting). However unlike stag-watching, mimicking calls or using those that have been pre-recorded cannot establish the density and

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abundance of Leadbeater's Possum in a given area of forest. Windy and/or wet conditions reduce the range and audibility of the call. Furthermore, Leadbeater's Possum does not respond after prolonged use of the call or when it is used in tandem with spotlighting.

Acknowledgements

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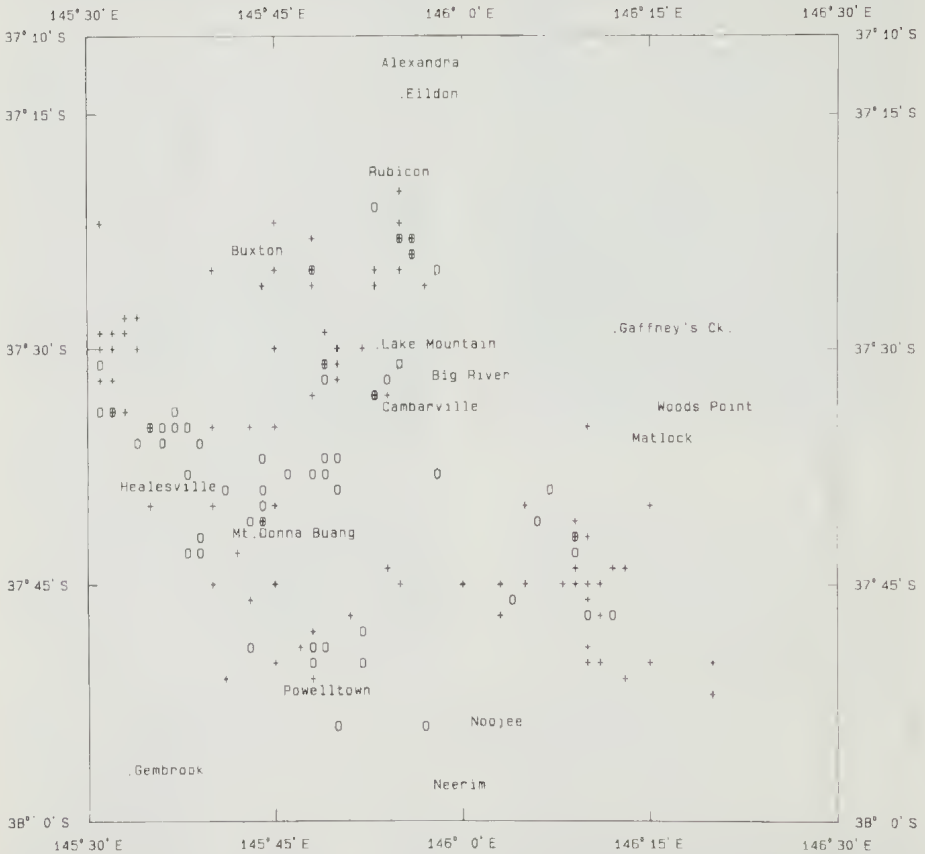


Fig. 2. The location of sighting records of Leadbeater's Possum established in this study (denoted O) together with those from the Victorian Mammal Database (denoted +). Scale = 1: 350 000.

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Appendix

The latitude and longitude of all records has been determined from 1: 100 000 NATMAP topographic maps. Elevation of survey sites has been estimated from 1: 25 000 Fire Control maps supplied by the Board of Works.

Lat. Long.	Alt. (m)	Location	Lat. Long.	Alt. (m)	Location
37 41 145 49	800	Acheron Gap.	37 49 145 48	800	0.5 km. NE
37 22 145 47	1000	Blue Range Rd.			Starlings Gap on
37 45 146 11	900	1km E bridge,			Big Ck. Rd.
		Upper Thomson	37 49 145 49	800	Gap Tk., Starlings
		River.			Gap.
37 42 146 10	960	Upper Thomson	37 48 145 52	760	Cnr. Federal Short
		River.			Cut and Federal Rd.
37 46 146 10	1060	Upper Thomson	37 50 145 52	760	Cnr Big Tree
		Rd.			Walking Tk. and
37 42 146 09	1040	2 km N Mt.	37 35 145 38	440	Federal Rd.
		Gregory.			"The Hermitage",
37 41 146 09	1100	3 km S Triangle.	37 54 145 53	680	Maroondah Hwy.
37 44 146 09	1020	4 km S Mt.			1.7 km. SE T/o
		Gregory.			Bunyip Rd. and
37 39 145 49	940	3 km N Acheron	37 54 145 50	780	A.P.M. Tk.
		Gap.			Cnr. Wodalls Tk.
37 45 146 08	1040	5 km NE Toorongo.			and Pioneer Ck.
37 50 146 11	600	1 km E Tanjil Bren.	37 49 145 49	820	Rd.
37 45 146 09	1020	Cnr. Thomson			Cnr. Big Ck. Rd.
		Valley, Noojee/			and Mississippi
		Matlock Rd.	37 43 145 39	1000	Fireline.
37 23 145 48	1040	4 km W Rubicon	37 53 145 38	520	1 km. E Ben Cairn.
		Dam.			2 km. SW Dom
36 00 146 00	900	Cnr MMBW Tks.	37 49 145 48	800	Dom on
		No. 8 and 27,			Maroondah Hwy.
		Upper Yarra Catch.			Monets Tk.
					junction with Tin
					Mine Ck.

Appendix (cont.)

Lat. Long.	Alt. (m)	Location	Lat. Long.	Alt. (m)	Location
37 54 145 57	800	Burgess Fire Trail 1 km. Nth Kobialkes Tk.	37 37 145 50	700	7.5 km. on Rd. 12, O'Shannassy Catch.
37 34 145 31	560	Cnr. Sylvia Ck. and Coles Ck. Rds.	37 41 145 44	900	0.2 km. Rd. 14, O'Shannassy Catch.
37 42 146 09	1000	17 km Rd. 9, Upper Yarra Catch.	37 35 145 35	820	Cnr Rd. 9 and Block 6 Rd., Toolangi.
37 46 146 04	1040	13 km Rd. 20, Upper Yarra Catch.	37 36 145 36	580	1 km. Rd. 39, Maroondah Catch.
37 43 146 09	1020	10 km Rd 11, Upper Yarra Catch.	37 23 145 55	1000	0.5 km. on Conns Gap Rd.
37 41 146 06	1060	1.5 km Rd. 10 T/o with Rd. 9, Upper Yarra Catch.	37 21 145 53	1000	1.3 km on Tk. 6, T/o Snobs Ck. Rd.
37 38 145 58	700	2 km on Rd. 27, Upper Yarra Catch.	37 42 145 39	1020	17.2 km on Rd. 3, Maroondah Catch.
37 39 146 07	1060	3.2 km W Triangle.	37 38 145 48	1180	Cnr Rds. 5 and 1, O'Shannassy Catch.
37 31 145 55	960	Koala Falls, Cambarville Rd.	37 50 145 48	800	Mackley Ck., Crossing with Big Ck Rd.
37 43 145 37	800	1 km W Ben Cairn.	37 34 145 54	800	Big Tree Tk., Cambarville.
37 34 145 37	720	Cnr Rd. 9 and Monda Tk., Maroondah Catch.	37 34 145 54	840	Snowy Hill Rd., Cambarville.
37 36 145 34	880	Cnr. Hardies Ck. Rd. and Monda Tk.	37 33 145 49	900	Cnr. Tommy's Bend Rd. and Yellow Dog Rd.
37 36 145 39	600	3 km. Rd. 8, Maroondah Catch.	37 26 145 48	1100	Blue Range Rd.
37 35 145 36	800	Cnr. Rds. 13 and 35, Maroondah Catch.	37 25 145 48	1100	Little River bridge, Blue Range Rd.
37 35 145 37	580	2.5 km on Rd. 9, Maroondah Catch.	37 25 145 48	1000	Storm Ck., 1 km W Blue Range Rd.
37 38 145 38	740	1.1 km from Viewpoint. 1, Rd. 3 Maroondah Catch.	35 25 146 53	1020	Royston River Rd.
37 39 145 41	780	8 km Rd. 27., Maroondah Catch.	37 34 145 32	960	Northern slopes Mt. St. Leonard.
37 39 145 50	520	12 km. Rd. 1, O'Shannassy Catch.	37 34 145 33	860	Hardy's Ck. Rd.
37 38 145 46	1140	0.7 km. Rd. 8, O'Shannassy Catch.	37 22 145 31	920	4.2 km N Mt. St. Leonard.
37 37 145 44	1080	3.9 km Rd. 8, O'Shannassy Catch.	37 47 146 03	1130	0.7 km. W summit Mt. Horsfall.
37 38 145 49	1140	0.8 km. Rd. 5, O'Shannassy Catch.	37 47 146 12	1120	Thomson Valley Rd.
37 37 145 49	840	2.9 km. Rd. 5, O'Shannassy Catch.			